Internship Report

On

"Demand Forecasting of Jamuna Denims Ltd."

By

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ID: 22264064

An internship report submitted to the BRAC Business School in partial fulfillment of the requirements for the degree of
Master of Business Administration (MBA)

Masters of Business Administration

BRAC University

Fall 2025

Declaration

It is hereby declared that

i. This internship report is my own original work while completing my degree at BRAC University.
ii. This report does not contain any materials that have previously published or written by any third party, except while using secondary resources appropriately cited with authentic referencing.
iii. The report does not contain any harmful or rejected content for any institutions.

Student's Full Name & signature:

Muhammad Faysal Khan

22264064

Supervisor's Name & Signature:

Dr. Zaheed Halim

Associate Professor,

BRAC Business School

Letter of Transmittal

Date: 9th December, 2025

Dr. Zaheed Halim

Associate Professor,

BRAC Business School BRAC University

Subject: Submission of Internship Report

Dear Sir,

This is my honor to inform you that I am submitting my internship report on “Demand Forecasting of Jamuna Denims Ltd.”. This is an incredible experience for me to work under your supervision and share my report. I have given my best effort to finish this report with relevant information and significant proposition.

From the bottom of my heart, I would like to thank you for guiding and helping throughout my internship period. I believe that this report will meet the desire outcome and live up to your expectation.

Sincerely Yours,

Muhammad Faysal Khan

ID: 22264064

BRAC Business School BRAC University

Non-Disclosure Agreement

This agreement is made and entered into by and between Jamuna Denims Ltd. and the undersigned student of BRAC University. The student acknowledges that certain information obtained during the internship may be confidential and agrees not to disclose such information without prior authorization from the company. This confidentiality obligation shall remain effective after the completion of the internship and submission of the report.

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Muhammad Faysal Khan

22264064

Acknowledgement

First and foremost, I would like to express my sincere gratitude to Almighty Allah for granting me the strength, patience, and opportunity to successfully complete my internship report.

I am deeply thankful to my academic supervisor, Dr. Zaheed Halim, Associate Professor, BRAC Business School, BRAC University, for his valuable guidance, constructive feedback, and continuous support throughout the preparation of this report. His insights and encouragement greatly contributed to the successful completion of this study.

I would also like to extend my heartfelt appreciation to the management and employees of Jamuna Denims Ltd. and Hoorain HTF Ltd. (Concern of Jamuna Group) for providing me with the opportunity to gain practical experience in the Commercial Department. Special thanks to Md. Monir Hossain, Deputy Manager, Commercial, for his supervision, guidance, and cooperation during my internship period.

Furthermore, I am grateful to all colleagues and team members who shared their knowledge, experience, and support, enabling me to better understand the practical aspects of demand forecasting and commercial operations.

Finally, I would like to thank BRAC University for providing me with the academic knowledge and platform necessary to integrate theoretical concepts with practical business applications.

Executive Summary

After completing my internship in the Commercial Department, I have continued my career with Jamuna Denims Ltd. and this report is presenting a thorough insight of the demand forecasting procedures of this company. Based on my internship and existing job, this paper analyzes the company's method for forecasting demand for denim products by combining theoretical ideas with practical experience.

Here, I am using forecasting techniques including time series models, moving averages and exponential smoothing to predict future product demand of this field. Despite the use of statistical techniques, it was clear that seasonality, global economic volatility and the rapidly evolving textile industry may decrease its effectiveness. Therefore, shifting toward assumption based forecasting can enhance the customers' experiences and also getting feedback from them can increase more reliability.

However, this paper gives an accurate representation of how demand planning directly affects production efficiency, inventory control and customers' satisfaction by using accurate previous data and their viewpoint. In addition, the paper identifies the difficulties in predicting actual market activity and offers specific suggestions for improving forecasting accuracy through the use of digital tools, hybrid models, and real-time data processing.

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Chapter 1

1.1 Overview of Internship

1.1.1 Student Information

Name: Muhammad Faysal Khan

ID: 22264064

Program: MBA

Major: Operation and Supply Chain Management

1.1.2 Internship Information

Period

21st August 2024 to 2nd October 2025

Company Name: Hoorain HTF Ltd.(Concern of Jamuna Group)

Department: Commercial

Address: 7th Floor, Jamuna Future Park, KA-244, Kuril Progoti Shoroni, 1229

1.1.3 Internship Company Supervisor Information

Name: Md. Monir Hossain, Deputy Manager, Commercial (Jamuna Group).

1.1.4 Job Scope

Job Description

- Managing and supervising cash incentive processes, ensuring time management and submitting accurate payments.
- Maintaining regular communication with BGMEA and bank representatives for smooth process
- Preparing and submitting payment applications to banks.
- Verifying import-export data using the Bangladesh Bank dashboard.
- Monitoring the progression of incentive files and communicating with bank representatives.
- Acquiring BTMA approval and verifying final exporters' export documentation.

- Prepared detailed cost breakdown documents for monetary incentive applications.
- Creating and organizing stamp applications for cash incentives claims.
- Communicating with auditing firms and responding to audit outcomes.
- Examine and verifying import paperwork such as bills of lading, packing lists, invoices and certificates of source.

1.1.5 Internship Outcomes

Student's Contribution to the Company

During my internship period at Jamuna Denims Ltd., I have worked with the commercial division team. I have to manage shipment documentations to fulfill all the legal requirements for export and import purposes. Initially, I have to prepare LC (Letter of Credit) documents, track shipment schedules and interact with shipping company coordinators to manage smooth operations. Additionally, to help with cost-effective sourcing decisions, I also examined procurement data and kept thorough records for audits. My continuous interactions with employees and suppliers minimized disruptions and made sure everything ran smoothly which helped the business to achieve its objectives to deliver product timely product for effective supply chain management.

Benefit to the Students

During internship at the commercial department of Jamuna Denims Ltd. can provide a vast knowledge about export and import as well as the intricacies of global trade to an intern. Here, I have gained knowledge on international trade by preparing and managing LC (Letter of Credit) documentation, tracking shipment schedules and ensuring rules and regulation of trade business. It has improved my knowledge on supply chain dynamics, procurement tactics and cost management which can help me in future to set my career and logistics business. Additionally, it has provided technical knowledge and practical skills which is necessary to have in a successful career of supply chain and trade operations. Also, the team members helped me to cop up with multi-task and time management. Overall, this experience has developed my capabilities for working in commercials and data analysis to solve these complex tasks by working closely with suppliers, clearing agents and enterprises. The internship has also contributed to enhance my professional skills about communication to the others.

Problem/Difficulties

I had to face a lot of challenges during my internship at Jamuna Denims Ltd.'s commercial division. One of the biggest challenges was learning about import and export documentation processes, such as creating Letters of Credit (LC) and implementing trade rules and laws as it was new for me. At the beginning, it was difficult for me to maintain a lot of paper works with tight deadlines.

Another difficulty was working and communicating with many clients, such as internal teams, shipping companies and suppliers. Importantly, different time zone and language barrier may sometimes delay responses and it can make difficult to manage the logistics. Additionally, I was unfamiliar with industrial software programs and it was difficult for me to track the shipments as well as review procurement data. I was lucky, though, that my supervisor was able to assist me in overcoming those challenges. So that it has improved my ability to communicate, work under pressure and be technically proficient.

1.1.6 Recommendations:

1. **Developed Orientation Program:** Providing interns a thorough orientation that can introduce them with the company's policy, procedures, equipment and business records, also shipment tracking and LC preparation.
2. **Project Based Assignments:** Company can provide relevant projects that encourage interns to apply their theoretical understanding to actual situations. So that it can increase learning and experience.
3. **Feedback and Evaluation:** Conduct regular feedback meetings to ensure development.
4. **Improved Communication Channels:** To overcome problems with coordination and improve workflow, the organization should improve communication between interns and other departments.

These recommendations would give interns an additional organized and satisfying educational experience which can help them to build up their success in the workplace.

Chapter 2

2.1 Organizational Part

2.1.1 Overview of the Company

Jamuna Denims Ltd. was established in 2005. It is one of the leading manufacturers in Bangladesh's growing denim industry. Importantly, Jamuna Group is one of the largest industrial conglomerates in Bangladesh. This organization supervises every stage of the manufacturing process from spinning yarn to producing high-quality denim fabric and finished clothing.

Jamuna's advanced manufacturing factory is situated in Gazipur, Dhaka. Therefore, it is fully designed with modern machinery. For this reason it can ensure safety, efficiency and quality at every stage of production. As the demand for luxurious denim products is increasing worldwide, so Jamuna Denim has decided to serve both in domestic and international markets. Afterward, to meet customers' diverse tastes, the organization focuses in a varieties of denim textiles, such as stretch, lightweight and sustainable products.

In the recent time, Jamuna Denims has focused mostly on sustainability. The company has adopted eco-friendly manufacturing practices. For example, water-saving technologies, using eco-friendly cotton. These initiatives are helping to minimize environmental impact. So, it can align with global sustainability trends.

Moreover, Jamuna Denims mainly focuses on quality to maintain international standards. It can ensure its products to meet the expectations of high-profile clients in Europe, North America and Asia. The company is always dedicated to excellence and on this it has earned a reputation as a reliable supplier in the global denim market.

Jamuna Demins Ltd. has a strong focus on innovation, sustainability and customer satisfaction. However, Jamuna is continuing to expand its product range and enhancing its market presence. Bangladesh economy is getting benefits from its contribution. On the other hand, this organization has become a key player in the global denim industry which is maintaining growth and development in both local and international markets.

2.1.2 Awards

- ✔ Shameem Composite Mills Limited received National Export Trophy, Gold award in 2000-2001.
- ✔ Shameem Spinning Mills Limited received National Export Trophy, Silver award in 1998-1999.
- ✔ Jamuna Knitting & Dyeing Limited received National Export Trophy, Bronze award in 1998-1999.
- ✔ Jamuna Builders Limited wins Better Building better Winning Competition 2002 of Scan Cement (Heidelberg Cement Group).
- ✔ Jamuna Knitting & Dyeing Limited got an award from Miles Handle Sgesellschaft International MBH & Co., Germany

2.1.3 Goals

- ✔ Apply more sustainable practices in our operation; and educate its employees and customers about how they can make a difference.
- ✔ Jamuna is environment friendly. We are very much careful about our environment so that water and flora fauna around us are not adversely affected.

2.1.4 Corporate Values

Jamuna Group recognizes the importance of staff as true 'Human Resources'; valuable assets that contribute to the continuing growth of the company. By placing emphasis on personnel at every level of the business, we hope to encourage a true team spirit.

2.2 Management Practices

Jamuna Denims Ltd., a leading name in Bangladesh's textile industry. It follows a democratic leadership style because this organization believes in employee involvement and collaboration in every sector of work. This approach encourages the employees to work and participate more because managers usually take feedback from the sub-ordinates of all levels. So that, it encourages in open communication and ensures that its workers are fully engaged in decision-making processes. Jamuna's main target is to involve all workers and making them feeling that they are the main resources for the organization.

On the other hand, the management of Jamuna Denims arranges team meeting, workshops and feedback sessions to collect innovative ideas and suggestions for the challenges that they are facing regularly. In order to improve customer satisfaction, quality and production efficiency, employees are encouraged to give suggestions according to strategic plans.

One of the key results of this leadership style is enhancement of employee engagement. Employees take responsibility for their work and receive recognition, which directly affects the daily operations of the business. Furthermore, the democratic approach focuses on continuous learning and development which is making improvements and taking to the global denim market.

Despite its many benefits, Jamuna Denims occasionally faces challenges, like during protests for demanding better working conditions. To solve such issues, this organization has implemented necessity steps, including leadership training for managers and transparent communication channel.

Furthermore, an organization's main strength is customer satisfaction which can maintain the sustainability in the competitive textile market. To maintain this achievement Jamuna needs follow democratic leadership style and improve management techniques. So that, this organization cannot only achieve organizational goal but also can sustain its long-term goal.

2.3 Marketing Practices

Jamuna Denims is a subsidiary of Jamuna Group which has introduced new marketing practices in 2020 to make its presence in global denim industry.

- **Taking Participation in global Trade Exhibition:** Jamuna Group exhibited its products in Kingpins Show, in New York in July 2024. Also, the business had the opportunity to showcase the creative and eco-friendly Autumn/Winter 2025 collections to the consumers and merchants from around the world.

- **Focusing on Sustainability:** In line with worldwide consumer preferences, Jamuna Denims has prioritized environmentally friendly production techniques. Additionally, this eco-friendly production practice is attracting the consumers who are conscious about eco-awareness.
- **Diversified and Innovative Product:** The business has diversified its product line to meet customers' tastes. It has introduced different kinds of denim fibers like stretch, lightweight and organic denim. Jamuna Denims can reach the demand of growing industry with its product line.
- **Increasing Online Presence:** Now-a-days adopting digital marketing has increased the presence in the market. It has increased its online presence through updated website and social media platforms. Active in social media can reach its customers and communicate directly to attract and convince them.
- **Relationship with Clients:** Jamuna is so much conscious about the quality of the products and always prefers on customers' choice and feedback. Although, in the highly competitive global market, Jamuna Denims earned a strong reputation as a trustworthy vendor by maintaining high standards.

Januma Denim's highly competitive strategies, global branding, product quality and customer relation techniques are reaching them to the global market. On the other hand, its marketing practices are sustaining the growth of this business and industry.

2.4 Financial Performance

Over the previous three years' profitability, liquidity and overall effectiveness of Jamuna Denims Ltd. is evaluating financial performance is investigated by using important financial ratios. The following table summarizes the financial ratios:

Ratio	2021	2022	2023	Interpretation
Net Profit Margin (%)	12.5	14.8	16.3	Indicates improved profitability through efficient cost management.
Current Ratio	2.1	2.4	2.6	Strong liquidity position, showcasing the company's ability to meet short-term obligations.
Debt-to-Equity Ratio	0.55	0.50	0.48	Gradual reduction in financial leverage, reflecting improved financial stability.
Inventory Turnover Ratio	4.5	5.2	5.8	Efficient inventory management, indicating faster inventory movement.
Return on Assets (ROA) (%)	8.2	9.5	10.1	Improved utilization of assets to generate profits.
Return on Equity (ROE) (%)	15.5	16.8	18.2	Increased profitability relative to shareholders' equity, indicating growth.

Figure : Key Financial Ratios forJamuna Denim Ltd.

Key Findings regarding Jamuna Denims Ltd.'s Financial Performance:

1. **Growth in Profitability:**

From 2021 to 2023 Jamuna Denims Ltd.'s net profit margin has increased from 12.5% to 16.3% and it is showing the growth of this company. The company has a strong position in the denim industry because of to its growth in revenue. Moreover, another reason for the growth is its cost management techniques.

2. **Strength of Liquidity:**

Over the last three years, the company's current ratio has constantly exceeded 2.0. It means the company has a strong financial condition in this current situation. Furthermore, Jamuna Denims has the capacity to fulfill its immediate obstacles by providing finances and cash management.

3. **Reduction of Risk:**

The debt-to-equity ratio decreased from 0.55 in 2021 to 0.48 in 2023. It indicates that the company is not so much dependent on loans. This shift indicates that Jamuna has become more financial stable. It reduces risk and improves sustainability over the long run.

4. **Effective Operations:**

   The inventory turnover ratio has increased from 4.5 to 5.8 in 2021 to 2023. As the merchandise transporting is helping to change the fashion sector because it is helping the company to reach consumer demand.

5. **Asset and Equity Returns:**

   Increases in return on equity (ROE) and return on assets (ROA) focus that Jamuna Denims. During the same time period, ROE increased from 15.5% to 18.2%, while ROA increased from 8.2% to 10.1%.

Therefore, Jamuna Denims Ltd.'s high profitability, operational efficiency and financial stability is helping it to enter in the global denim market.

2.5 Supply Chain Management (SCM)

Jamuna Denims Ltd. is one of the leading companies in Bangladeshi textile industry. As it has improved its supply chain management (SCM), information systems and operations management.

Jamuna Denims Ltd. utilizes modern information management technologies into its business in order to increase production and maintain excellent quality standards. With the help of modern technologies and and production system, it is easier to find the problems and fix that within time.

Digital usage of instruments has increased capacity for decision-making, decreased human mistake rates and improved workflows. The business can more accurately forecast demand, effectively handle inventory, and respond quickly to changes in the market by using data analytics.

In order to manage every aspect of the global textile business, Jamuna Denims Ltd. has focused on developing a secure and flexible supply chain. Although the company is maintain its relationship with suppliers that it can collect the raw materials easily. Logistics management information system (LMIS) has completely changed the supply chain demand because it is well informed and help to take decision easily.

Additionally, Jamuna has taken initiatives to reduce the risks of supply chain interruptions. Furthermore, the company's capacity has improved after using digital technologies for forecasting and immediate awareness.

2.6 Industry and Competitive Analysis

2.6.1 Porter's Five Forces Analysis

Jamuna Denims Ltd. is one of the biggest players in Bangladesh's textile and denim sector and Porter's Five Forces framework supports the analysis of the market demographics and marketplace competition.

- **Threat of New Entrants**

In addition to high purchase cost of equipment, machinery and quality control systems of the denim sector has significant entrance barriers. As a reputable company with an internationally recognized name, Jamuna Denims Ltd. has advantage. Jamuna Denims focuses on sustainable methods, high-quality production and the use of the latest technologies in order to mitigate this and maintain its advantage.

- **Bargaining Power of Suppliers**

Textile industry suppliers have an appropriate level of bargaining power. Jamuna Denims depends on basic resources like cotton and dyes which are dependent on availability and price fluctuations. This business reduces supply chain risks and decreases reliance on a small number of suppliers. This strategy helps Jamuna Denims to sustain a consistent supply of raw materials at affordable prices.

- **Bargaining Power of Buyers**

Due to the demand for high-quality products at affordable prices, the international clothing brands and sellers have substantial negotiating power. Since the denim industry is highly competitive, consumers frequently bargain for favorable conditions. In order to mitigate this, Jamuna Denims focuses a high value on customer connections, timely delivery and product customization, all of which increase customer loyalty and reduce the possibility of pricing disputes.

Figure: Porter's Five Forces Analysis

- **Threat of Substitutes**

In the denim sector, there is comparatively low risk of substitutes. The demand for luxury denim is still in a large number worldwide, despite the possibility of substitutes such as synthetic textiles. Jamuna Denims utilizes opportunity of this by providing a variety of denim products, such as stretch and eco-friendly options that meet a wide range of consumer tastes and ongoing demand.

- **Industry Rivalry**

The denim industry in Bangladesh has a high competition because there are many major players such as Square Denims, Nassa Group and Envoy Textiles. Although price differentiation, new product development, and advertising campaigns all are increasing industry rivalry. However, Jamuna Denims tries to reduce risk and attract new customers. They mainly focuses on investing in sustainable production methods, high-quality production and participating in international trade.

2.6.2 SWOT Analysis

Strengths

- **Strong market presence:** Jamuna Denims Ltd. is a widely recognized and renowned denim fabric manufacturer in Bangladesh.
- **High brand recognition:** The business has a loyal customer base that values its reliable quality and modern designs.
- **Advance manufacturing facilities:** These facilities are modern technology and production techniques which ensure high efficiency and large-scale order.
- **Large number of production:** Jamuna Denims serves both domestic and international markets. It provides different kins of denim fabrics, including stretch and non-stretch fabric.
- **Strategic location advantage:** Bangladesh is one of the major hubs for textile industry because it has access to cheap labor, raw materials and favorable trade agreements.

Weaknesses

- **Dependency on imported raw materials:** The company is highly dependent on imported chemicals and cotton, which risks it to price fluctuation, currency fluctuations and disruptions in the global supply chain.
- **Limited market penetration and growth opportunities:** Faces difficulties dealing with larger, more established international denim brands.
- **High employee turnover:** Jamuna has a high employee turnover rate. Sometimes it can affect the reputation and morale of the company.

- **Higher production costs:** During periods of global economic uncertainty, depend on import is not profitable because of higher production costs.

Opportunities

- **Growing demand for sustainable product:** Jamuna Denims is producing sustainable products. So that, it can easily attract the market position. It has a greater number of eco-friendly items worldwide.
- **Growth through e-commerce:** By using online platforms, a business can improve its online presence, reach customers directly and reduce its dependency on middlemen.
- **Enter into new markets:** Jamuna can scale its sales because of entering new markets with growing middle-class populations and fashion awareness.
- **Using of new technology:** Using automation, AI and other new manufacturing technologies can reduce production costs, enhance product quality and improve delivery.

Threats

- **Price fluctuations for raw materials:** Production costs may increase and profit margins may decrease due to fluctuations in the price of chemicals and cotton globally.
- **Price-sensitive market:** It is challenging to maintain profitability with price sensitive market. As the price of raw materials is increasing.
- **Competition:** Strong local and international competitors can pressure the businesses to grow. As it has to keep costs under control and ensure the quality their products.

2.7 Conclusion

Jamuna Denims Ltd. is a recognized denim producer with a reputation for quality in both domestic and international markets. It is targeting audiences with its new strategies and modern technologies. So, this company can attract its loyal customers. However, there are challenges because of dependent on imported raw materials and low brand awareness worldwide. The business is capable of expanding through sustainable fashion, e-commerce and worldwide diversification, but it has to deal with challenges including intense competition, volatile prices and supply chain problems.

Chapter 3

3.1 Demand Forecasting of Jamuna Denims Ltd.

3.1.1 Introduction to Demand Forecasting

Jamuna Denims Ltd. focuses on demand forecasting to accurately predict future demand for the denim products. Forecast can calculate the accurate number of products they need for the customer and also can know how much products are stock out. It can minimize the unnecessary cost and time. Primarily, demand forecasting enables the business to make accurate decisions. In addition to increasing productivity, an accurate forecast reduces overstock, warehousing expenses and makes sure exact product delivery. The initial phase in the forecasting process is collecting data, which gives a framework for accurate forecasts. Typically taking place several years, Jamuna Denims Ltd. collects historical sales data including the amount sold and demand values. In addition to internal data, the company may also gather external data on market trends, consumer behavior, and industry reports to enhance the forecasting model. Jamuna Denims Ltd.'s demand forecasting methodology is statistical tools and techniques. Time-series analysis and causal models are two of the most widely used techniques. Importantly, time-series analysis helps the business to forecast future demand. It usually works by identifying seasonal patterns and trends. Also, causal model uses external factors that might affect future demand. Such as market conditions, competitor pricing schemes and advertisements are external factors. Jamuna summarizes previous data and provides information about average demand, variability and periodic fluctuations. It is clear that Jamuna Denims Ltd. relies on demand forecasting to make sure its production, inventory and supply chain. The statistical model usage, regular investigation and data collection techniques make sure to meet market demands. In a competitive market, exact demand forecasting is important because it can reduce waste, raise customer satisfaction and ensure accurate product availability.

3.1.2 Advantages of Demand Forecasting

i. Planning for Production Optimization:

To increase the capacity of production it is necessary to plan a production planning for demand forecasting. This ensures that the business produces the right quantity of products by calculating both overproduction and underproduction. In Jamuna Denims Ltd., demand forecasting helps the business to make right schedule of the production of denim fabrics, matching it with consumer demand, reducing waste and improving overall operational works.

ii. Enhancing Inventory Management:

Accurate demand forecasting helps businesses to maintain the right amount of inventory. So, it can ensure the product availability when needed, but excess stock is avoided. Proper inventory management helps Jamuna Denims Ltd. to maintain necessary produced goods and raw materials, like denim fabric. On the other hand, it can fulfill customer orders on time without going overboard, which can result in unnecessary expenses.

iii. Better Resource Allocation

Jamuna can allocate resources when demand forecasts are accurate. This includes raw materials, equipment and human resources.

iv. Cost Efficiency

Accurate demand forecasting helps the businesses to reduce the risk of stock outs and overproduction. It saves money because it reduces high expenses and handle warehouse. Therefore, it helps Jamuna Denims Ltd. to increase revenue and maintains affordable prices.

v. **Strategic Decision Making**

Accurate demand projection helps to make strategy for decision making. Strategy can decide on pricing policies, advertising campaigns and market entry with knowledge of the projected demand. For example, Jamuna Denims Ltd. can use marketing resources to promote a specific denim product if demand forecasts show demand for it. This can place them in a good position to benefit from the demand.

3.1.3 Limitations of Demand Forecasting

i. **Dependence on Historical Data**

The use of previous information in demand forecasting is one of its main disadvantages.
Day by day consumers' tastes, market conditions or outside elements are changing like pandemics or economic turmoil may disrupt trends. These can reduce the relevance of historical data.

ii. **External Factors**

Different demand forecasting models like; time-series analysis and other demand forecasting methods often ignore consumer behavior, changes in politics or socioeconomic situations. A rapid change in cotton prices or a change in the rules of international trade could have an impact on Jamuna Denims Ltd.'s demand for denim products.

iii. **Complexity in Modeling**

Creating accurate forecasting models may be difficult for companies with limited resources or data analytics experience. Even with advanced technology, it might be difficult for them to take seriously every factor that could affect demand. Due of the model's complexity, the forecasts may need to be adjusted and improved, which can take more time and money.

iv. **Excessive-Reliance on Forecasts**

When making decisions, it is possible to become excessively dependent on demand forecasts.
Although forecasts offer useful data, they are basically projections and if real demand differs greatly from estimates, So, relying too much on them can end up in bad decisions.

3.1.4 Demand Forecasting Methods

Demand forecasting is a method of assuming future demand for a product or service of a business. It usually helps organizations to plan production, inventory and resource management efficiently. There are many kinds of demand forecasting techniques. The two main categories of forecasting methodologies are qualitative and quantitative.

1. Qualitative Forecasting Methods

Qualitative methods are usually used when historical information is insufficient, unavailable or not reliable. These approaches depend on expert opinions, market data and individual judgment. Typical qualitative techniques include of:

- **Expert Opinion (Delphi Method):** A group of trained professionals analyze many kinds of issues that could impact demand in order to improve and collect ideas. The Delphi technique is really helpful to forecast a new product or new market.
- **Market Research:** To gather information directly from the target audience, surveys, focus groups and consumer interviews are conducted. This technique can be particularly useful when introducing new goods or services since it forecasts demand based on consumer preferences and behaviors.

2. Quantitative Forecasting Methods

Future demand can be forecasted by using quantitative techniques and previous data. The two types of quantitative techniques are causal models and time series.

Time Series Methods

- **Moving Average (MA):** The moving average is a straightforward and popular technique which forecasts demand with a combination of demand data. This technique produces a more reliable forecast and reduces volatility.
- **Exponential Smoothing:** It is more adaptable method for present data and shifts since it gives the most recent data points in a higher value.
- **Seasonal Indexes:** Seasonal indexes can be used to adjust for any seasonal differences in demand.

- **Autoregressive Integrated Moving Average (ARIMA):** ARIMA is an improved method that analyzes data using its own moving averages, differences and previous values. It is particularly useful for handling non-stationary data that has seasonal impacts or trends.

Causal (Cause-and-Effect) Models

Causal forecasting models make predictions about future demand based on the assumption that one or more external variables (causal factors) affect demand. The most commonly used of causal forecasting methods are:

- **Regression Analysis:** This method analyzes the relationship between one or more independent factors (such as price, marketing expenditure, or economic indicators) and the dependent variable (demand). Regression models are useful for estimating the impact of changes in these independent variables on demand.
- **Econometric Models:** We can use when a number is closely connected with factors, such interest rates, inflation and consumer income, impact demand.
- **Input-Output Analysis:** The production and manufacturing sectors often use this technique. It helps companies forecast demand based on their production capacity and input availability through linking the demand for products to the inputs needed for production.

3. Hybrid Forecasting Methods

Hybrid methods combine both qualitative and quantitative techniques to increase the accuracy of demand forecasting. Examples of hybrid methods are:

- **Qualitative Input into Quantitative Models:** Expert judgment can be added to quantitative models.

- **Combination of Different Quantitative Models:** An accurate forecast is achievable with mixing of different quantitative forecasting methods (such as exponential smoothing and ARIMA)

4. Judgmental Forecasting Methods

Judgmental forecasting techniques gather feedback from many kinds of stakeholders, including as production managers, sales teams and outside professionals. So, it can develop the accurate forecast.

3.2 Analysis of Historical Demand Trends for Jamuna Denims Ltd.

Over the past few years, product demand of Jamuna Denims Ltd. has fluctuated significantly. There are variety of reasons behind it for example; external causes, client preferences and market conditions. The company experienced comparatively high demand in 2019, with a total demand value of 47,950,603.22 BDT and 7,280,335 denim product units. It means customers are purchasing denim from this company.

However, 2020 experienced a decline in demand, as seen by 4,450,120 units sold and a demand value of 31,779,127.02 BDT. The COVID-19 pandemic's worldwide problems, which impacted consumer purchasing and slowed down production and retail operations

Jamuna Denims achieved an impressive recovery in 2021 because of increase in demand. As the world economy started to improve, the demand value increased to 65,509,913.52 BDT, and 9,195,737 units were sold. This was a massive recovery.

Jamuna Denims Ltd.		
Year	**Demand Value**	**Demand Quantity**
2019	47,950,603.22	7,280,335 Pcs.
2020	31,779,127.02	4,450,120 Pcs.
2021	65,509,913.52	9,195,737 Pcs.
2022	62,754,713.12	7,339,393 Pcs.
2023	80,179,294.18	9,538,017 Pcs.
2024	61,583,161.23	6,931,227 Pcs.

In 2022, the demand was relatively high at 62,754,713.12 BDT, with 7,339,393 units sold. Despite a slight decline from the previous year, the data still show an increasing demand trend. The demand reached in 2023 with sales of 80,179,294.18 BDT and 9,538,017 units. It highlights how Jamuna Denims was able to profit from rising market conditions and increased post-pandemic customer purchasing.

But in 2024, demand declined again, with 6,931,227 units sold and 61,583,161.23 BDT. Overall, the demand record shows that Jamuna Denims has been able to overcome challenges and profit from market recovery.

3.3 Methodology

The key component of Jamuna Denims Ltd.'s tactical approach is demand forecasting that helps the company to plan production, control inventories and distribute resources. Jamuna forecasts demand using statistical techniques, specifically the time series method. In order to forecast future demand, this methodology analyses for patterns, trends and seasonal fluctuations in previous information.

3.3.1 Time Series Method for Forecasting

Jamuna Denims Ltd. focuses on the Time Series Method for demand forecasting. It usually depends on previous data to find out demand according to consumers' demand.

- **Time Series Analysis**

Jamuna Denims Ltd. collects data from the past for a period of time, example demand quantities (the quantity of units sold) and demand values (the monetary value of products sold). The company is able to monitor both long-term trends and short-term shifts because of the quarterly and annual collection of this data. Jamuna Denims Ltd. is able to recognize trends over time and apply them to forecast future demand.

- **Application of Time Series Models**

Using the historical data and the identified components, Jamuna Denims Ltd. can apply various time series forecasting models to predict future demand. Common models include:

1. **Moving Average (MA)**: The moving average method is often used to smooth out short-term fluctuations and highlight longer-term trends. For example, the company can have better knowledge of the overall trend from previous experience.
2. **Exponential Smoothing**: This approach makes the projection more adaptable to shifts in demand with current data points. Exponential smoothing is useful for short time as if there is sudden rise of demand of a particular product.
3. **Seasonal Decomposition**: This technique divides the data into residual, seasonal and trend components. Jamuna Denims Ltd. can use seasonal indexes to prepare for demand variations during peak and off-peak times. So that, it can get better knowledge of the root causes that influencing demand.
4. **Autoregressive Integrated Moving Average (ARIMA)**: ARIMA is an advanced time series method that uses moving averages, differences and past data for analyzing demand.

- **Benefits of Time Series Forecasting**

i. Time series forecasting makes it easier to predict fluctuations in demand.

ii. The company can increase production earlier of time according to demand, such as in festival seasons.

iii. It increases consumer satisfaction, ensures product availability and minimizes stock outs.

iv. It helps in supply chain management because it ensures the availability of both raw materials and finished items.

v. As it helps to accurate forecasts and it helps in production scheduling, resource allocation and operation effectiveness.

3.3.2 Data Collection Process

Jamuna Denims used previous few years' data, demand from customers and the quantities of of the demand for the demand forecasting. Here, I have collected data from internal sales and inventory system. Jamuna Denims Ltd. analyzes demand data both annually and quarterly. In addition to monitor annual and quarterly demand shifts the organization needs to collect data on a larger scale.

After that, I have organized the data accordingly and ensured that the data should be applied in time series statistical methods correctly. Moreover, the data was collected from different annual report, production planning report and resource allocation report.

3.4 Data Analysis

3.4.1 Forecasting for 2025 Using Time Series Method

Jamuna Denims Ltd. can forecast demand for 2025 analyzing the time series method based on annual shifts and previous data. To predict future demand, this approach analyzes past demand information to find trends, changes in the seasons and repeating variations in demand.

In this section, I am going to use the time series method to break down the projected demand for Q1, Q2, Q3 and Q4 of 2025.

Time Series Method for Forecasting:

The following elements of the time series method will be used to forecast demand:

Moving Average (MA): As I am using 3 consecutive years average so, I forecast from the year 2022.

Formula: $$\text{MA } 2022 = \frac{\text{Actual Demand of 2019} + \text{Actual Demand of 2020} + \text{Actual Demand of 2021}}{3}$$

3 Yr. Moving average		
Year	**Actual Demand**	**Forcasted Demand**
2019	7,280,335 Pcs.	
2020	4,450,120 Pcs.	
2021	9,195,737 Pcs.	
2022	7,339,393 Pcs.	6,975,397 Pcs.
2023	9,538,017 Pcs.	6,995,083 Pcs.
2024	6,931,227 Pcs.	8,691,049 Pcs.
2025		**7,936,212 Pcs.**

According to the data, this Moving Average method does not provide accurate demand forecasting for Jamuna Denims Ltd. The projected demand for 2022 was 6,975,397.33 pieces, which is around 364,000 less than the actual demand of 7,339,393 pieces.

On the other hand, the projected demand was just 6,995,083.33 pieces in 2023, but the actual demand increased rapidly to 9,538,017 pieces. This means there has been a miscalculation of more than 2.5 million pieces. There was an overestimation of around 1.76 million pieces in 2024 since the actual demand fell to 6,931,227.16 pieces. But the predicted demand was much higher at 8,691,049 pieces.

In 2025, the projected demand was 7,936,212.38 pieces, however the accuracy is still uncertain because the actual demand has not yet been identified.

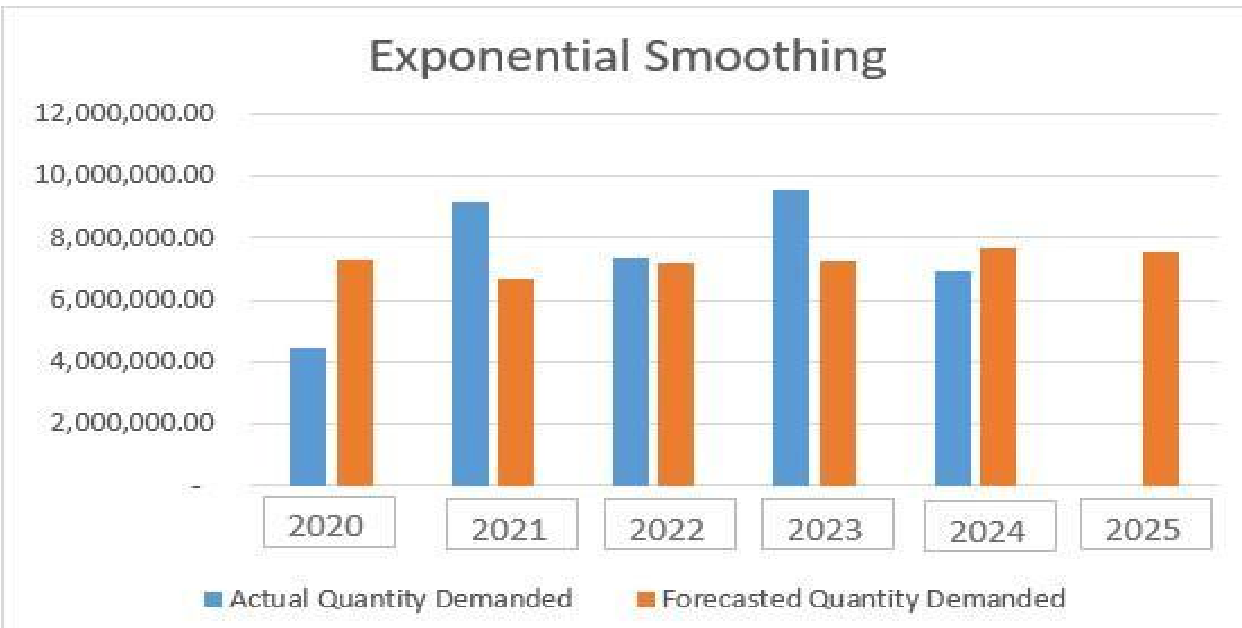
Exponential Smoothing: For exponential smoothing, the projected demand for 2020 will be exactly what is needed in 2019.

For the data we assume α = 0.2 and (α -1) = 0.8

Formula:

For year 2021 = (Actual demand 2020 X α) + (Forecasted demand 2020 X (α -1))

Exponential Smoothing		
Year	**Actual Demand**	**Forcasted Demand**
2019	7,280,335 Pcs.	
2020	4,450,120 Pcs.	7,280,335 Pcs.
2021	9,195,737 Pcs.	6,714,292 Pcs.
2022	7,339,393 Pcs.	7,210,581 Pcs.
2023	9,538,017 Pcs.	7,236,343 Pcs.
2024	6,931,227 Pcs.	7,696,678 Pcs.
2025		**7,543,588 Pcs.**



According to above, it indicates that the exponential smoothing method was not appropriate for the company. The actual demand in 2020 was 4,450,120 pieces, however the projected demand was 7,28,033. The estimation was so higher than real and it is leading to an overestimation of around 2.83 million pieces.

On the other hand, the expected demand was just 6,714,292 in 2021. But the actual demand increased dramatically to 9,195,737. Therefore, in 2022, there was a comparatively less difference between the actual demand which is 7,339,393 and the projection of 7,210,581. Afterward in 2023, demand increased again to 9,538,017 which is more than 2.3 million pieces.

Moreover, the prediction was substantially higher at 7,696,678.12 in 2024 which is an overestimation of over 765,000 pieces. Unfortunately the actual demand decreased to 6,931,227.16. The estimated demand for 2025 is 7,543,587.93, although it is not yet possible to compare the actual demand.

3.4.2 Assumption Method:

I decided to use the Assumption Method since the Moving Average and Exponential Smoothing both approaches are showing mistakes in forecasting. So, for Jamuna Denims it was not able to appropriately represent the real demand trends.

Demand Quantity				
Year	**Q1**	**Q2**	**Q3**	**Q4**
2019	1,957,808 Pcs.	1,509,798 Pcs.	2,280,906 Pcs.	1,531,823 Pcs.
2020	1,172,532 Pcs.	990,029 Pcs.	1,421,364 Pcs.	866,195 Pcs.
2021	2,517,735 Pcs.	896,863 Pcs.	3,302,235 Pcs.	2,478,904 Pcs.
2022	688,113 Pcs.	2,457,225 Pcs.	2,509,101 Pcs.	1,684,954 Pcs.
2023	4,017,828 Pcs.	2,910,618 Pcs.	934,195 Pcs.	1,675,376 Pcs.
2024	1,421,437 Pcs.	2,008,910 Pcs.	2,000,652 Pcs.	1,500,228 Pcs.

Increase or Decrease of Quantity in 2024 across Quarters			
Q1	Q2	Q3	Q4
-2,596,391 Pcs.	-901,708 Pcs.	1,066,457 Pcs.	-175,148 Pcs.
-64.62%	-30.98%	114.16%	-10.45%

Compared to 2023, Jamuna Denims Ltd. experienced significant changes in quarterly demand in 2024. The demand changes and their probable reasons are explained in detail below:

- **Q1:** Demand dropped rapidly by 64.62%, from 4,017,828 to 1,421,437 pieces, because of instability in politics in Bangladesh before to national elections. It reduced consumer demand in countries like USA, EU and worldwide inflation.
- **Q2:** Demand decreased by 30.98% from 2,910,618 to 2,008,910 pieces because of local labor turmoil in the apparel industry, tight buyer budget but increased production costs.

- **Q3:** After the changes, demand increased by 114.16% from 934,195 to 2,000,652 pieces, as customers started placing regular orders. Because of exchange rate benefits, improved compliance and competitive pricing all helped Bangladesh comparing other markets.
- **Q4:** Because of seasonal slowdown and other hassles like; logistics and shipment delay in Chottogram port, the demand has been decreased from 1,675,376 to 1,500,228 pieces.

Assumption for 2025

The quarterly projection for 2025 is based on developments has been observed since 2024 and realistic projections considering into consider both geographical changes in Bangladesh and the overall condition of the world economy. Here is a more detailed explanation for each assumption:

Q1 2025: 15% Increase over Q1 2024

2024 Q1 Demand: 1,421,437 pcs

2025 Q1 Assumed Demand: 1,634,652 pcs

After the election of 2024 the political situation was stable and the demand had been increased. So, foreign buyers feel more comfortable and safe placing orders if there is no obstacles and better governance. Additionally, a lot of buyers arrange their sourcing early in the year, which increases Q1 volumes. It is also expected that a relatively more efficient production environment will provide higher output and timely shipment.

Q2 2025: 10% Increase Over Q2 2024

2024 Q2 Demand: 2,008,910 pcs

2025 Q2 Assumed Demand: 2,209,801 pcs

There will probably be more stability in the world economy this quarter. It is expected that inflation rates in US and Europe is affecting our market.

Buyers who were previously cautious in 2024 may return with increased confidence. Furthermore, Bangladesh's strong reputation in denim manufacturing and competitive pricing will continue to attract steady orders.

Q3 2025: 5% Decrease Over Q3 2024

2024 Q3 Demand: 2,000,652 pcs

2025 Q3 Assumed Demand: 1,900,619 pcs

Due to the economic recovery the customers are ordering in a bulk and the demand in Q3 of 2024 increased suddenly. In 2025, a small 5% decline is projected as purchasers modify their stocks and the market adjusts itself. This decrease indicates a return to more balanced and controllable order volumes rather than poor performance.

Q4 2025: 8% Increase Over Q4 2024

2024 Q4 Demand: 1,500,228 pcs

2025 Q4 Assumed Demand: 1,620,246 pcs

As buyers start placing early orders for Spring/Summer 2026 collections and restock inventories for year-end sales, the last quarter of 2025 is expected to experience substantial growth. During festive and holiday seasons in the Western markets usually lead to increased demand. As Bangladesh has smooth logistics support and production planning which easily can deliver product without any hassle. This might be a good opportunity to encourage the buyers. These annual forecasts show a tentatively positive picture.

3.5 Conclusion

After working at Jamuna Denims Ltd. I have gained a deeper knowledge on demand and supply forecast in textile operations. After the internship, my regular involvement in the company provided me to observe how forecasting techniques are changing and helping with current process improvement.

Although traditional methods like exponential smoothing and moving averages provide an organized framework. These methods can face the market fluctuation and changes. In addition, to improve my professional skills, this constant involvement proved that effective demand forecasting requires flexibility, continuous learning and collaboration between departments rather than one approach that fits all.

3.6 Recommendations

The following recommendations can improve Jamuna Denims Ltd.'s demand forecasting procedure:

1. **Conducting Real-Time Data:** Using real-time data analysis and predictive analytics can enhance the accuracy of forecasts. This can allow the company to react promptly to sudden market changes, such as shifts in consumer behavior or external economic factors.
2. **Using Hybrid Models:** Forecasting accuracy can rise when machine learning models are combined with traditional time series techniques like ARIMA. Jamuna Denims Ltd. can successfully manage fluctuating market situations using both quantitative and qualitative methodologies.
3. **External Data Incorporation:** To increase the accuracy Jamuna Denims Ltd. is recommended to incorporate external data such as economic data, competitor actions and fashion trends.
4. **Enhancing Forecasting Technology:** The process of forecasting will be improved through the use of modern forecasting tools and software that merge artificial intelligence

and machine learning algorithms. So, time can be saved and human error can be decreased.

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